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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,513	03/10/2004	Brian S. Higgins	7340-011	4226
4678 MACCORD M	7590 06/10/2009 IASON PLLC		EXAM	INER
300 N. GREEN	NE STREET, SUITE 1600		SUERETH, SARA	AH ELIZABETH
P. O. BOX 297 GREENSBOR			ART UNIT	PAPER NUMBER
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			MAIL DATE	DELIVERY MODE
			06/10/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

		Application No.	Applicant(s)
		10/797,513	HIGGINS, BRIAN S.
	Office Action Summary	Examiner	Art Unit
		Sarah Suereth	3749
Period fo	The MAILING DATE of this communication app or Reply	ears on the cover sheet with the c	orrespondence address
A SH WHIC - Exter after - If NC - Failu Any	ORTENED STATUTORY PERIOD FOR REPLY CHEVER IS LONGER, FROM THE MAILING DANSIONS of time may be available under the provisions of 37 CFR 1.13 SIX (6) MONTHS from the mailing date of this communication. Operiod for reply is specified above, the maximum statutory period were to reply within the set or extended period for reply will, by statute, reply received by the Office later than three months after the mailing ed patent term adjustment. See 37 CFR 1.704(b).	ATE OF THIS COMMUNICATION 36(a). In no event, however, may a reply be timularly and will expire SIX (6) MONTHS from cause the application to become ABANDONE!	I. lely filed the mailing date of this communication. O (35 U.S.C. § 133).
Status			
2a)⊠	Responsive to communication(s) filed on <u>25 Fe</u> This action is FINAL . 2b) This Since this application is in condition for allowan closed in accordance with the practice under E	action is non-final. nce except for formal matters, pro	
Dispositi	ion of Claims		
5)□ 6)⊠ 7)□	Claim(s) <u>17-34</u> is/are pending in the application 4a) Of the above claim(s) is/are withdraw Claim(s) is/are allowed. Claim(s) <u>17-34</u> is/are rejected. Claim(s) is/are objected to. Claim(s) are subject to restriction and/or	vn from consideration.	
Applicati	ion Papers		
10)	The specification is objected to by the Examiner The drawing(s) filed on is/are: a) access Applicant may not request that any objection to the of Replacement drawing sheet(s) including the correction The oath or declaration is objected to by the Examiner	epted or b) objected to by the Edrawing(s) be held in abeyance. See on is required if the drawing(s) is obj	ected to. See 37 CFR 1.121(d).
Priority u	ınder 35 U.S.C. § 119		
a)	Acknowledgment is made of a claim for foreign All b) Some * c) None of: 1. Certified copies of the priority documents 2. Certified copies of the priority documents 3. Copies of the certified copies of the prior application from the International Bureau See the attached detailed Office action for a list of	s have been received. s have been received in Application ity documents have been received (PCT Rule 17.2(a)).	on No od in this National Stage
2) Notice	t(s) te of References Cited (PTO-892) te of Draftsperson's Patent Drawing Review (PTO-948) mation Disclosure Statement(s) (PTO/SB/08) or No(s)/Mail Date 1/21/09.	4) Interview Summary Paper No(s)/Mail Da 5) Notice of Informal Pa	te

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DETAILED ACTION

Response to Amendment

1. Receipt of applicant's amendment filed on 02/25/09 is acknowledged...

Claim Rejections - 35 USC § 103

- 2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 3. Claims 17-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,375,949 to Salooja ("Salooja") in view of U.S. Patent No. 4,029,752 to Cahn ("Cahn"), and further in view of U.S. Patent No. 4,196,057 to May ("May") (previously cited), Altman (5,011,516), and applicant's admitted prior art.

Salooja discloses in the specification and figures 1-10 an invention in the same field of endeavor as applicant's invention and similar to that described in applicant's claims 17-34.

In particular, in regard to at least claim 17, Salooja discloses a method of reducing the acidity (each of nitrogen oxides and sulfur trioxides, see cols. 5-7) comprising the steps of:

partially combusting the fuel in a first stage to create a reducing environment in situ (see at least col. 1, lines 50-54);

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maintaining the reducing environment for a sufficient time period such that reducible acids are reduced to a predetermined level to achieve a desirable acidity concentration in the flue gas (see at least col. 1, lines 54-59 and col. 7 lines 5-20describing that the nitrogen oxides and sulfur tri-oxides are controlled to desired/predetermined levels);

combusting the remainder of the fuel and combustion intermediates in a second stage with oxidizing environment; thereby decreased the acidity of the flue gas by reducing the acid concentration of the gas (see at least col. 1, lines 60-63 and lines 29-33).

In regard to the limitation the reducible acids are reduced "by electron addition", while Salooja does disclose that the nitrogen oxides and sulfur trioxides are reduced, the reference does not appear to go into further detail as to the mechanisms of the chemical reduction, namely "by electron addition."

Cahn teaches a method of reducing sulfur oxides that is considered to be in the same field of endeavor as both applicant's invention and Salooja. Cahn describes that sulfur oxides in a process gas stream are reduced by reaction with ammonia (i.e. NH3) as a reducing agent (see at least col. 7, lines 48-52). Cahn clearly provides that sulfur trioxide is reduced in the same manner as the described processes for sulfur dioxide (see at least col. 7, lines 34-38). The examiner notes that at least ammonia (NH3) is considered to be the type of reducing radical described in applicant's specification (see specification p. 9, line 14 lists NHi). Further, the examiner also notes that Cahn also suggests that other reducing agents such as H2, CO, and CH4 (also listed in applicant's

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specification) are recognized in the art as reducing radicals creating a reducing environment (see Cahn, col. 7, lines 65-68). This describes process of employing either ammonia or other above noted agent to result in the reduction of sulfur trioxide (a reducible acid) is considered to suggest the reduction by election addition described in applicant's specification and claimed in claim 17.

Returning to Salooja, while this reference provides only some detail of the reducing of sulfur trioxides through the practice of the described method, there is clear suggestion that the reduction of sulfur trioxides is recognized in the art. Accordingly, a person of ordinary skill in the art at the time the invention was made would desirably modify the process in Salooja to incorporate the reduction by electron addition suggested by Cahn to desirably produce a gas stream that has "little or no" sulfur trioxide (see at least Cahn, col. 8, lines 41-46).

Salooja and Cahn teach substantially all of the limitations of the methods recited in claims 17-23 and 25-31, with exception of the steps of adjusting the reducing environment to lower the flue acid gas dewpoint (claims 17 and 23), improving ESP function (claims 17 and 25), and measuring acid dewpoint (claim 23). These additional steps have not been identified in Salooja or Cahn.

However, In regard to claims 17 and 25, the acid of concentration of the flue gas is directly related to the acid dew point temperature of the flue gas. This is expressly noted by applicant in applicant's description of the prior art, namely "...as the SO3 concentration increases, the acid dew point temperature of the flue gas increases." (see applicant's specification, p. 1, lines 16-18). To further support this assertion the

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examiner also points to May. May discloses a method which provides that "[m]easurement of dew point enables a semi-quantitative determination of the sulfur trioxide concentration in the exhaust or flue gas" (see May, col. 5, lines 30-32 and 38-42). Accordingly, a person of ordinary skill in the art would understand that reduction of the acid concentration of the flue gas necessarily results in the lowering of the acid dew point level of the flue gas. As noted above, Salooja provides for the reduction of sulfur oxides from the effluent of flue gas of a furnace to a desired level (see at least col. 1, lines 54-59 and cols. 5-7). Therefore, a person of ordinary skill in the art would reasonably understand that obtaining the reduction target of the oxides in the flue gas as specified in Salooja would necessarily result in a corresponding desired dew point level (again see at least May, col. 5, lines 38-42).

Also in regard to claims 17 and 25, it is unclear whether the Salooja apparatus includes an ESP device. However, Altman teaches that fly ash is conventionally removed from combustion gases by electrostatic precipitation (col. 1, lines 7-10). Altman also teaches that the concentration of sulfur trioxide must be controlled to optimize the performance of the ESP filter (col. 1, lines 17-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Salooja apparatus to include the ESP device, as Altman teaches they are conventionally used to control fly ash (col. 1, lines 7-10).

Accordingly, a person of ordinary skill in the art would understand that reduction of the acid concentration of the flue gas necessarily results in optimizing the performance of an ESP device. As noted above, Salooja provides for the reduction of

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sulfur oxides from the effluent of flue gas of a furnace to a desired level (see at least col. 1, lines 54-59 and cols. 5-7). Therefore, a person of ordinary skill in the art would reasonably understand that obtaining the reduction target of the oxides in the flue gas as specified in Salooja would necessarily result in a corresponding improved performance of the ESP device (again see at least Altman, col. 1, lines 17-21).

In regard to at least claim 18 and 19, Salooja describes that a catalytic burner is supplied at least in the first stage that produces lower NOx production than conventional combustion systems (see at least col. 2, lines 7-12, col. 6, line 67 through col. 7, line 4 and col. 4, lines 31-47) and thus reasonably suggests micro-staging through the use of low-NOx burners.

In further regard to claims 18 and 19, as noted above, while the examiner considers that the operation of the catalytic burners suggests the recited micro-staging using low NOX burners, even if this is not a proper understanding, the examiner notes that applicant admits that the use of micro-staging using low-NOx burners to reduce emissions in combustion furnaces is known in the art (see admitted prior art of page 5, lines 4-18 of applications' specification). Accordingly, even if the operation of the catalytic burners of Salooja are not properly considered to be applicant's recited microstaging using low NOx burners, a person of ordinary skill in the art would desirably seek to incorporate mircro-staging using low NOx burners in the process of Salooja in order to desirably aid in reducing NOx emissions (see admitted prior art of p. 5, lines 4-18 of applications' specification).

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In regard to at least claims 20-24 and 26-31, applicant also admits that the use of macro-staging using over-fired air and used in combination with micro-staging using low NOx burners is known in the art (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification). Accordingly, a person of ordinary skill in the art would seek to employ macro-staging using over-fired air in a combustion stage and/or in combination of micro-staging using low NOx burners to desirably achieve NOx emissions reduction (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification). Regarding claim 24, Salooja teaches burning a "carbonaceous fuel", which is considered to suggest coal.

Regarding claims 33 and 34, Salooja teaches reducing the concentration of sulfer trioxide to 18 ppm (col. 7, line 17).

In regard to claim 25, this claim includes limitations similar to that of claim 17 with the additional method step of "measuring the acid dewpoint of the flue gas." Salooja possibly does not expressly disclose actively measuring the acid dewpoint of the flue gas.

However, May, as previously noted, clearly provides that the dew point of the exhaust gas is measured to determine a concentration of sulfur trioxide (see May, col. 5, lines 30-32). Further, May provides that the measurement of the dew point also allows for determination of "cold end" corrosion locations (May, col. 5, lines 32-34) and further that the inherent corrosion rate measurement that arises form the dewpoint measurement "indicates the degree of inhibition of an additive such as magnesium and the actual condition at the surface." (May, col. 5, lines 34-37).

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Accordingly, a person of ordinary skill in the art would desirably modify the method of Salooja to incorporate measuring the acid dewpoint of the flue gas as taught in May to determine the level of corrosion that results from the additives in the flue gas (see May, col. 5, lines 30-37).

Response to Arguments

- 4. Applicant's arguments with respect to claims 17-34 have been considered but are not persuasive.
- 5. Applicant argues that Salooja teaches away from the claimed invention. Applicant has quoted col. 3 lines 26-31. The examiner interprets that passage to say that an increase in the levels of SO₂ results in a higher dew point temperature than similar operation with lower levels of SO₂. However, Salooja does not appear to be comparing the dew point temperature of the acid to the temperature of the flue gas. It is well known in the art that the dew point of the acid must remain higher than the flu gas, or else the acid condenses and forms acid rain. Salooja states explicitly that the apparatus operates to perform reduction of SO₃ without the risk of sulphuric acid corrosion (col. 9 lines 1-4). If applicant's interpretation of the Salooja reference was correct, there would be substantial sulphuric acid corrosion due to condensing of the SO₃.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Suereth whose telephone number is (571)272-9061. The examiner can normally be reached on Mondays & Tuesdays 8:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven McAllister, can be reached (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sarah Suereth/ Examiner, Art Unit 3749

/Steven B. McAllister/ Supervisory Patent Examiner, Art Unit 3749

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	A	3,105,540	10/1963	Hardgrove		431	9			
	В	3,528,797	09/1970	Funk, et al.		71	39			
	C	3,565,757	02/1971	Warshaw, et al.		23	2			
	D	3,773,897	11/1973	Fields, et al.		423	235			
,	E	3,847,564	11/1974	Marion et al.		48	95		-	
	F	3,860,384	01/1975	Vulliet et al.		41	4			
	G	3,900,554	08/1975	Lyon	· · · · · ·	423	235			
	Н	3,970,739	07/1976	Shiraishi et al.		423	23 S			
<u></u>	I	4,021,188	05/1977	Yamagishi et al.		431	158			
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	K	4,039,446	08/1997	Ban et al.		210	688		
	L	4,080,423	03/1978	Smith et al.		423	210		
	M	4,089,639	05/1978	Reed et al.		431	211		
	N	4,119,702	10/1978	Anuhata et al.		423	235		
	Ó	4,150,631	04/1979	Frey et al.		110	186	,	· · · · · · · · · · · · · · · · · · ·
	P	4,154,581	05/1979	Nack et al.		48	197R		•
	Q	4,173,454	11/1979	Heins		44	522		
	R	4,196,057	04/1980	May et al.	-	205	775.5		
	S	4,208,386	06/1980	Arand et al.		423	235		
	T	4,213,944	07/1980	Azuhata et al.		423	235		
	U	4,294,178	10/1981	Borio et al.		110	347		· ·
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	Ž	4,469,050	09/1984	Korenberg		122	4D			
	AA	4,502,633	03/1985	Saxon		239	422			
	BB	4,504,211	03/1985	Beardmore		44	604			
	CC	4,506,608	03/1985	Strohmeyer, Jr.	•	110	245			
	DD	4,507,075	03/1985	Buss et al.		431	115			
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	GG	4,584,948	04/1986	Syred et al.		110	264		
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	II	4,627,965	12/1986	Hegemann et al.		423	242		
	JJ	4,672,900	06/1987	Santalla et al.		431	9		
	KK	4,704,084	11/1987	Liu et al.		431	7		
	LL	4,751,065	06/1998	Bowers		423	235		
	MM	4,777,024	10/1988	Epperly et al.		423	235		
	NN	4,780,289	10/1988	Epperly et al.		423	235		
	00	4,809,910	09/1998	Svendssen		110	235		
	PP	4,824,441	04/1989	Kindig		44	604		
	QQ	4,842,834	06/1989	Burton		423	235		
	RR	4,873,930	10/1989	Egnese et al.		110	345		
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11111111	SS	4,915,036	04/1990	DeVita			110	215			
-,	TT	4,927,612	05/1990	Bowers			423	235			
	บบ	4,926,711	10/1990	Yamauchi et al.			110	347			
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	ww	4,985,218	01/1991	DeVita	· · · · · · · · · · · · · · · · · · ·		423	235			
	XX	4,992,249	02/1991	Bowers	-		423	235	-		
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	ZZ	5,032,154	07/1991	Wright			422	109			
	AAA	5,048,432	09/1991	Hogmann		-	110	345			
	BBB	5,052,921	10/1991	Hemsath			423	121			
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	CCC	5,057,293	05/1990	Epperly, et al.		423	235			
	DDD	5,105,747	04/1992	Khinkis et al.		110	345			
	EEE	5,139,754	08/1992	Luftglass et al.		423	235			
	FFF	5,146,858	09/1992	Tokuda et al.		110	261	•		
	GGG	5,240,404	08/1993	Hemsath et al.		431	9			
	ННН	5,261,602	11/1993	Brent et al.		239	132.3			
	Ш	5,286,467	02/1994	Sun et al.		423	239.1			
	JJJ	5,310,334	05/1994	Sprios		431	5			
	KKK	5,336,081	08/1994	Saito et al.		431	190			
	LLL	5,342,592	08/1994	Hoblyn et al.		423	235			
	MMM	5,345,883	09/1994	Panos		110	345			
	NNN	5,536,482	07/1996	Diep et al.		423	235			
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	000	5,489,419	02/1996	Diep et al.		423	235			
	PPP	5,585,081	12/1996	Chu et al.		423	239.1	<u> </u>		
	QQQ	5,690,039	11/1997	Monroe et al.		110	264			
	RRR	5,707,596	01/1998	Lewandowski et al.		423	235			
	SSS	5,728,357	03/1998	von Harpe		423	239.1			
	TTT	5,809,910	09/1998	Svendssen		110	235			
	UUU	5,853,684	12/1996	Fang et al.		423	239.1			
-	VVV	5,854,173	12/1998	Chang et al.		502	417			
	www	6,019,068	02/2000	Tsuo et al.		122	4D			
	XXX	6,042,371	03/2000	Mitani et al.		431	215			
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IIIIII	TTT	6,109,911	08/2000	Tamminen et al.			431	4			
	บับบั	6,190,628	02/2001	Carter			422	168			:
	VVV	6,213,032	04/2001	Breen et al.			110	345			· · · · ·
	www	6,230,664	05/2001	Janka et al.			122	4D			
	XXX	6,280,695	08/2001	Lissiamski et al.		******	423	239.	1		
	YYY	6,315,555	11/2001	Salzsieder e al.			431	183			
	ZZZ	6,357,367	03/2002	Breen et al.	,		110	345			
	AAAA	6,398,039	06/2002	Xue et al.			210	504			
	BBBB	6,485,289	11/2002	Kelly et al.		-	431	4			
	CCCC	6,527,828	03/2003	Flippo et al.			95	54			
	DDDD	6,532,905	03/2003	Belin et al.			122	4D			
	EEEE	6,818,043	11/2004	Change et al.			95	37			
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	FFFF	7,198,769	04/2007	Cichanowicz		423	239.1	5	
	GGGG	7,335,014	02/2008	Higgins		431	4		
	НННН	2003/0011948	06/2003	Gaita et al.	9	96	108		
	Ш	2004/0045437	03/2004	Chang et al.	(095	134		
	JJJJ	2004/0120872	06/2004	Fan et al.	4	423	239.1		
	KKKK	2004/0185399	09/2004	Moberg	- 4	431	4		
	LLLL	2004/0185402	09/2004	Moberg		431	9		
	MMM	2004/0185401	09/2004	Moberg	4	431	9		
	M	200 1/0105 101	05/2001	1,1000,10					
	0000	2004/0253161	12/2004	Higgins		423	235		
	PPPP	2005/0000901	01/2005	Campbell et al.		210	660		
	1111	2000,000000	1 33 37.		· · · · · · · · · · · · · · · · · · ·				
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	QQQQ	2005/0002841	01/2005	Moberg		423	235			
	RRRR	2005/0013755	01/2005	Higgins		423	235			
	SSSS	6,953,494	10/2005	Nelson, Jr.		95	134			
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	TTTT	DE 28 37 156	03/1979	Germany (See US 5,146,	858)					
	UUUU	WO/87/03507	06/1987	WIPO				X		
	VVVV	WO/05/079305	08/1999	EPO				-		
		1,01031019303	00/1999							
	www	EP 0 287 224	10/1998	EPO				X		
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	XXXX	EP 0936405	08/1999	EPO				X		
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	AAAAA	JP 53-112273	09/1978	Japan (See US 5,797,596)					
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	CCCCC	Energy efficiency-our specialty-by Mobotec; undated related technology											
	DDDDD	Combined DeNox/DeSox and additional NOx Reduction by Cleaning Flue Gas Condensate from Ammonia,											
	EEEEE	Moberg, et al, presentation at PowerGen Intl. 11/30-12/2/99 RJM-LT, "Does This New NOx Control Technology Obsolete SCRs?"; RMJ Corp., undated related											
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